

## CLAIMS

What is claimed is:

1. In a system that shares performance monitoring units between multiple  
5 execution units, a method comprising:  
    receiving a request from an execution unit to at least one of start and stop  
performance monitoring operation;  
    maintaining a correct sequence of requests to start and stop performance monitoring  
operation;  
10 performing arbitration to acquire exclusive execution for one of a plurality of  
request initiators;  
    allocating a request to start performance monitoring operation;  
    determining a number of allocated requests to start performance monitoring  
operation;  
15 initiating performance monitoring operation;  
    removing a request to start performance monitoring operation;  
    determining an active mode of performance monitoring operation; and  
    completing performance monitoring operation.
2. The method of claim 1, wherein maintaining the correct sequence of  
20 requests comprises ensuring that the stop request follows the start request for the same  
execution unit, and additional requests are ignored.
3. The method of claim 1, wherein allocating the request comprises indicating  
to the system that a request to start performance monitoring operation is pending for a  
specific execution unit.
- 25 4. The method of claim 1, wherein allocating the request and initiating of  
performance monitoring operation are performed if a request to start performance  
monitoring operation was received.
5. The method of claim 1, wherein removing the request comprises indicating  
to the system that no request to start performance monitoring operation is pending for the  
30 current execution unit.
6. The method of claim 1, wherein removing the request, determining active  
mode, and completing of performance monitoring operation are performed if a request to  
stop performance monitoring operation was received.

7. The method of claim 1, wherein initiating performance monitoring operation comprises programming the performance monitoring unit to start collecting performance data for the execution unit that requested said operation if no other request was previously allocated.

5 8. The method of claim 7, further comprising at least one of setting an initial performance value to the current value of performance monitoring unit counter and setting the initial performance value and the performance monitoring unit counter to a predefined value.

10 9. The method of claim 1, wherein initiating performance monitoring operation further comprises programming the performance monitoring unit to start collecting performance data for the execution unit that requested said operation, in addition to collecting performance data of other execution units which previously requested said operation if there are other requests previously allocated.

15 10. The method of claim 1, wherein determining the active mode of performance monitoring operation comprises detecting whether programming of performance monitoring unit was performed for the execution unit that requested to stop performance monitoring operation.

20 11. The method of claim 1, wherein completing performance monitoring operation comprises retrieving final performance data and programming the performance monitoring unit to stop collecting of performance data if no other requests for the performance monitoring unit are allocated.

25 12. The method of claim 1, wherein completing performance monitoring operation further comprises programming the performance monitoring unit to stop collecting of performance data for the execution unit that requested said operation, if there are other requests previously allocated and the performance monitoring unit was in active mode for the execution unit.

30 13. The method of claim 12, further comprising retrieving current performance data, setting the initial performance value equal to the value retrieved or reprogramming the performance monitoring unit to start counting from a predefined value and setting the initial performance value equal to the predefined value.

14. The method of claim 12, further comprising:  
selecting another execution unit;

programming the performance monitoring unit to start collecting performance data for the selected execution unit.

15        15.     The method of claim 14, wherein selecting another execution unit comprises selecting, by external means, of a request previously allocated by another execution unit and determining the execution unit that allocated said request.

16.     The method of claim 14, wherein programming the performance monitoring unit further comprises enabling performance data collection for the selected execution unit in addition to performance data of other execution units which previously requested said operation.

10        17.     An article comprising: a machine accessible medium having a plurality of machine readable instructions, wherein when the instructions are executed by a processor, the instructions provide for sharing of performance monitoring units between multiple execution units by:

15             receiving a request from an execution unit to at least one of start and stop performance monitoring operation;

              maintaining a correct sequence of requests to start and stop performance monitoring operation;

              performing arbitration to acquire exclusive execution for one of a plurality of request initiators;

20             allocating a request to start performance monitoring operation;

              determining a number of allocated requests to start performance monitoring operation;

              initiating performance monitoring operation;

              removing a request to start performance monitoring operation;

25             determining an active mode of performance monitoring operation; and

              completing performance monitoring operation.

18.     The article of claim 17, wherein instructions for maintaining the correct sequence of requests comprise instructions for ensuring that the stop request follows the start request for the same execution unit, and additional requests are ignored.

30        19.     The article of claim 17, wherein instructions for allocating the request comprise instructions for indicating to the system that a request to start performance monitoring operation is pending for a specific execution unit.

20. The article of claim 17, wherein instructions for allocating the request and initiating of performance monitoring operation are executed if a request to start performance monitoring operation was received.

21. The article of claim 17, wherein instructions for removing the request  
5 comprise instructions for indicating to the system that no request to start performance monitoring operation is pending for the current execution unit.

22. The article of claim 17, wherein instructions for removing the request, determining active mode, and completing of performance monitoring operation are executed if a request to stop performance monitoring operation was received.

10 23. The article of claim 17, wherein instructions for initiating performance monitoring operation comprise instructions for programming the performance monitoring unit to start collecting performance data for the execution unit that requested said operation if no other request was previously allocated.

15 24. The article of claim 23, further comprising instructions for at least one of setting an initial performance value to the current value of a performance monitoring unit counter and setting the initial performance value and the performance monitoring unit counter to a predefined value.

20 25. The article of claim 17, wherein instructions for initiating of performance monitoring operation further comprise instructions for programming the performance monitoring unit to start collecting performance data for the execution unit that requested said operation, in addition to performance data of other execution units which previously requested said operation if there are other requests previously allocated.

25 26. The article of claim 17, wherein instructions for determining the active mode of performance monitoring operation comprise instructions for detecting whether programming of performance monitoring unit was performed for the execution unit that requested to stop performance monitoring operation.

30 27. The article of claim 17, wherein instructions for completing performance monitoring operation comprise instructions for retrieving final performance data and programming the performance monitoring unit to stop collecting of performance data if no other requests for the performance monitoring unit are allocated.

28. The article of claim 17, wherein instructions for completing performance monitoring operation further comprise instructions for programming the performance monitoring unit to stop collecting of performance data for the execution unit that requested

said operation, if there are other requests previously allocated and the performance monitoring unit was in active mode for the current execution unit.

29. The article of claim 28, further comprising instructions for retrieving current performance data, setting the initial performance value equal to the value retrieved or reprogramming performance monitoring unit to start counting from a predefined value and setting the initial performance value equal to the predefined value.

30. The article of claim 28, further comprising instructions for:  
selecting another execution unit;  
programming the performance monitoring unit to start collecting of performance data for the selected execution unit.

31. The article of claim 30, wherein instructions for selecting another execution unit comprise instructions for selecting, by external means, of a request previously allocated by another execution unit and determining the execution unit that allocated said request.

32. The article of claim 30, wherein instructions for programming the performance monitoring unit further comprise instructions for enabling performance data collection for the selected execution unit in addition to performance data of other execution units which previously requested said operation.

33. A system that shares performance monitoring units between multiple execution units comprising:

logic to receive a request from an execution unit to at least one of start and stop performance monitoring operation;

logic to maintain a correct sequence of requests to start or stop performance monitoring operation;

logic to perform arbitration to acquire exclusive execution for one of a plurality of request initiators;

logic to allocate a request to start performance monitoring operation;

logic to determine a number of allocated requests to start performance monitoring operation;

logic to initiate performance monitoring operation;

logic to remove a request to start performance monitoring operation;

logic to determine an active mode of performance monitoring operation; and

logic to complete performance monitoring operation.

34. The system of claim 33, wherein logic to maintain a correct sequence of requests comprises logic to ensure that the stop request follows the start request for the same execution unit, and additional requests are ignored.

5 35. The system of claim 33, wherein logic to allocate the request comprises logic to indicate to the system that a request to start performance monitoring operation is pending for a specific execution unit.

36. The system of claim 33, wherein logic to allocate the request and initiate performance monitoring operation is activated if a request to start performance monitoring operation was received.

10 37. The system of claim 33, wherein logic to remove the request comprises logic to indicate to the system that no request to start performance monitoring operation is pending for the current execution unit.

38. The system of claim 33, wherein logic to remove the request, determine active mode, and complete performance monitoring operation is activated if a request to  
15 stop performance monitoring operation was received.

39. The system of claim 33, wherein logic to initiate performance monitoring operation comprises logic to program the performance monitoring unit to start collecting performance data for the execution unit that requested said operation if no other request was previously allocated.

20 40. The system of claim 39, further comprising logic to at least one of set an initial performance value to the current value of a performance monitoring unit counter and set the initial performance value and the performance monitoring unit counter to a predefined value.

41. The system of claim 33, wherein logic to initiate performance monitoring  
25 operation further comprises logic to program the performance monitoring unit to start collecting performance data for the execution unit that requested said operation, in addition to performance data of other execution units which previously requested said operation if there are other requests previously allocated.

42. The system of claim 33, wherein logic to determine the active mode of  
30 performance monitoring operation comprises logic to detect whether programming of performance monitoring unit was performed for the execution unit that requested to stop performance monitoring operation.

43. The system of claim 33, wherein logic to complete performance monitoring operation comprises logic to retrieve final performance data and to program the performance monitoring unit to stop collecting of performance data if no other requests for the performance monitoring unit are allocated.

5 44. The system of claim 33, wherein logic to complete performance monitoring operation further comprises logic to program the performance monitoring unit to stop collecting performance data for the execution unit that requested said operation, if there are other requests previously allocated and the performance monitoring unit was in the active mode for the current execution unit.

10 45. The system of claim 44, further comprising logic to retrieve current performance data, to set the initial performance value equal to the value retrieved or to reprogram performance monitoring unit to start counting from a predefined value and set the initial performance value equal to the predefined value.

46. The system of claim 44, further comprising:

15 logic to select another execution unit;

logic to program the performance monitoring unit to start collecting performance data for the selected execution unit.

47. The system of claim 46, wherein logic to select another execution unit comprises logic to select, by external means, a request previously allocated by another execution unit and to determine the execution unit that allocated said request.

20 48. The system of claim 46, wherein logic to program the performance monitoring unit further comprises logic to enable performance data collection for the selected execution unit in addition to performance data of other execution units which previously requested said operation.